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kind is then required to continue development despite the fact that the oxidations are going on to their fullest extent. That it is their fullest extent is indicated by the interesting fact that even complete cytolysis of an egg by saponin will not further accelerate its rate of oxidation.

Loeb analyzes the effect of the sperm in initiating development into two factors—first, the sperm contains a lysin, not readily diffusible into the egg of the same species, but readily so into eggs of other species, which produces a surface cytolysis. The surface cytolysis leads to membrane formation in eggs which form fertilization membranes as part of their normal development. Foreign cells and foreign fluids may contain similar "lysins," but eggs are immune to lysins of cells of the same species because they are impermeable to them. Hence they must be carried in by actual penetration of the spermatozoon. In most eggs, especially sea urchins, a second substance must also be carried into the egg to prevent the destructive effect caused by superficial cytolysis. Some eggs, *Asterina, Polynoë* and *Thalassema,* do not require the second corrective factor, due possibly to the fact, as Loeb suggests, that they already contain it or automatically form it. Again we note variability in an apparently fundamental point. The effect of the lysin is imitated by the various membrane-forming substances which if too concentrated lead to complete cytolysis of the egg. The effect of the second substance is imitated by the various correcting agencies, hypertonic sea water, low temperature or a prevention of oxidations by KCN and chloral hydrate.

The lysin, the membrane-forming substance, is the essential in causing development. How does it act? At present only suggestions can be made. A possible method and a very simple one would be the removal of some substance which prevents development. This view which has been suggested and discussed by Loeb and other authors seems the most probable one to-day. The problem of fertilization becomes as much a question of what causes the egg cell to cease development in a certain stage as of the cause for its further development by the entrance of a spermatozoon. In physiological terms we may say that the stoppage of development appears to be due to an inhibiting substance, that it is an auto-narcosis. The lysin in the sperm or any artificial method of causing development, even the prick of a needle, allows the inhibiting substance, the narcotic, to pass out. This result is possibly obtained, although Loeb does not definitely uphold this view, through increase in permeability of the egg. As already mentioned oxidations are not diminished in the resting condition of the starfish egg and it is interesting to note, as shown by Loeb, that oxidations in artificially narcotized cells are likewise not diminished. Narcosis is not due to asphyxiation but is probably due to decreased permeability. Certainly research along the line of cell permeability, especially functionally conditioned changes in permeability is the most promising field for a solution of the problem of development, as of many other biological processes.

The reader interested in developmental mechanics will be well repaid by a close study of Loeb's book. Here is collected in condensed and readable form the results of many years' study together with conclusions and ingenious hypotheses which stimulate to additional discoveries along these and other lines.

E. NEWTON HARVEY

PRINCETON, N. J.

Rocky Mountain Flowers: An illustrated guide for Plant-lovers and Plant-users: with twenty-five plates in color, and twenty-two plates in black and white. By FREDERICK EDWARD CLEMENTS, Ph.D., Head of the Department of Botany in the University of Minnesota, and State Botanist; Director of the Pikes Peak Alpine Laboratory, and EDITH SCHWARTZ CLEMENTS, Ph.D., Instructor in Botany in the University of Minnesota and in the Pikes Peak Alpine Laboratory. The H. W. Wilson Company, White Plains, N. Y., and New York City, 1914. Octavo, 392 pp. ($3.00.)

Tourists in the Rocky Mountains have waited long for such a book as this, and we hazard the guess that it will be eagerly accepted by them as the manual which will enable them to recognize and name the flowers they find on the high plains and in the mountain canyons. For such people the colored plates of approximately two hundred species, and the black and white plates, of not far from three hundred more, will prove most helpful. But aside from tourists and other summer residents of the Rocky Mountains there is a still larger class of people who will welcome this attractive book. For, contrary to the opinion of many who have never crossed the Great Plains, there are schools and colleges and universities with their students and teachers interested in the plant life about them. And to these we may add an increasing number of people who are interested in plants because they love them. In fact, these great highlands of the United States are coming to contain very many people to whom such a book as this will appeal very strongly. We can not imagine a better book for the high school libraries of the west, or for that matter for the libraries of the western colleges and universities. The beautiful plates, which were made by the junior author, must appeal to every pupil with any esthetic sense, as they must also to many cultured people outside of the schools.

The chief features of the book are its general key to families, in which the treatment is distinctly non-technical, accompanied by a chart of relationship that should make the determination of the family relatively easy. Following these are the Dicotyledonous orders, and families, followed later by the Monocotyledonous orders and families, with keys, again, to the genera, and later to the species. Here a useful feature is emphasized in giving rather fully the etymology of the generic names, a matter that will be appreciated especially by those who are not privileged to be in the classes of scholarly teachers. Each genus is briefly characterized, and following this the species are indicated by a key in which as many descriptive features as possible are emphasized. In passing it should be pointed out that the plates always include related plants, so that family relationship is thus emphasized. The black and white plates, again, emphasize the more difficult species, notably those of the grasses and sedges. This fact will add much to the usefulness of the book.

An introduction of nine pages gives some idea of "the general lines of the evolution of flowering plants from the ancestral ferns," and suggests "the relationships of the various groups." The discussion leads up to the "chart of relationship" mentioned above.

In the preface the authors have something to say about "species" that will show the scientific reader that they have been thinking of the problem of species limits. Of course this preface was not written for high school pupils, nor indeed for the tourist of limited scientific training, but for botanists this short preface will be found to contain some suggestive thoughts.

We are told by the authors that the range of the book includes "Colorado, Wyoming, most of Montana, northern New Mexico, eastern Utah, and western North, and South Dakota, Nebraska and Kansas," and no doubt it may be profitably used in a considerable area oustide of these limits.

The authors are to be congratulated upon the successful completion of this notable work.

Charles E. Bessey
The University of Nebraska

The Life of the Mollusca. By B. B. Woodward. London: Methuen & Co. 1913. 12mo. Pp. xii + 158. Pl. XXXII., 1 map.

This volume is one of a popular series intended to summarize existing published knowledge on the subject of which it treats, and not to present fresh information or new researches. It is distinctly not ecological, and, perhaps in deference to British prudishness, omits the existing data on the reproduction of the pulmonates, a body of facts which have more bearing on the life of these mollusks and have been more thoroughly observed than any other phases of molluscan life.